

**Space Weather Highlights**  
**15 February - 21 February 2016**

**SWPC PRF 2112**  
**22 February 2016**

Solar activity reached moderate levels early in the period due to an M1/1n flare (R1-minor radio blackout) from Region 2497 at 1056 UTC on 15 Feb, but low levels of activity were observed on 16-19 Feb with very low levels observed on 20-21 Feb as Region 2497 rotated behind the west limb. Region 2497 (N13, L=087, class/area=Eac/250 on 12 Feb) was the largest, most magnetically complex and active sunspot region on the disk this period, however, despite the frequency of solar activity this period no Earth-directed coronal mass ejections (CMEs) were observed.

No proton events were observed at geosynchronous orbit.

The greater than 2 MeV electron flux at geosynchronous orbit reached moderate levels on 15-16 Feb but an enhanced solar wind environment due to a coronal hole high speed stream (CH HSS) caused an increase to high flux levels throughout the remainder of the period (17-21 Feb), with a peak value of 36,500 pfu observed at 1755 UTC on 19 Feb.

Geomagnetic field activity reached G2 (Moderate) geomagnetic storm levels this period. The onset of a south polar-connected negative polarity CH HSS caused and isolated period of active conditions late on 15 Feb, unsettled to G2 (Moderate) geomagnetic storms on 16-17 Feb, and unsettled to G1 (Minor) geomagnetic storms on 18 Feb. As the CH HSS rotated out of geoeffective position, geomagnetic field activity decreased from quiet to unsettled levels on 19-20 Feb to quiet levels on 21 Feb due to the return of a nominal solar wind regime.

**Space Weather Outlook**  
**22 February - 19 March 2016**

Solar activity is likely to be at low levels with a slight chance for M-class flares (R1-R2 (Minor-Moderate) Radio Blackouts) on 22-29 Feb and 15-19 Mar. C-class flares are expected on 01-14 Mar with a chance for M-class flares due to the anticipated return of Region 2497 (N12, L=087) which produced four M-class flares last rotation.

No proton events are expected at geosynchronous orbit, barring any significant flare activity.

The greater than 2 MeV electron flux at geosynchronous orbit is expected to reach high levels on 22 Feb and 15-19 Mar due to an enhanced solar wind environment caused by coronal hole high speed streams (CH HSSs). Moderate levels are likely on 23-24 Feb, 04-05, 07-08 and 13-14 Mar with low flux levels expected for the remainder of the period.

Geomagnetic field activity is likely to reach G1 (Minor) geomagnetic storm levels on 14-16 Mar and active field conditions are likely on 01, 03, 06 and 17 Mar, all due to the effects of multiple CH HSSs. The remainder of the period is expected to be at quiet or quiet to unsettled levels under a nominal solar wind regime.



### *Daily Solar Data*

Date	Radio Flux 10.7cm	Sun spot No.	Sunspot Area (10 <sup>-6</sup> hemi.)	X-ray Background Flux	Flares							
					X-ray			Optical				
					C	M	X	S	1	2	3	4
15 February	107	48	310	B5.4	15	1	0	12	4	0	0	0
16 February	104	49	260	B3.9	9	0	0	1	0	0	0	0
17 February	100	60	300	B4.3	16	0	0	5	0	0	0	0
18 February	95	35	70	B4.0	5	0	0	1	0	0	0	0
19 February	94	42	110	B2.4	6	0	0	0	0	0	0	0
20 February	100	46	210	B1.9	0	0	0	0	0	0	0	0
21 February	96	47	260	B1.7	0	0	0	3	0	0	0	0

### *Daily Particle Data*

Date	Proton Fluence (protons/cm <sup>2</sup> -day -sr)			Electron Fluence (electrons/cm <sup>2</sup> -day -sr)		
	>1 MeV	>10 MeV	>100 MeV	>0.6 MeV	>2MeV	>4 MeV
	15 February	1.6e+05	1.3e+04	3.0e+03	3.2e+06	
16 February	6.2e+05	1.2e+04	2.8e+03	1.9e+06		
17 February	1.4e+06	1.3e+04	3.3e+03	1.1e+08		
18 February	4.4e+06	1.3e+04	3.0e+03	3.7e+08		
19 February	6.3e+05	1.3e+04	3.2e+03	1.0e+09		
20 February	2.4e+05	1.3e+04	3.1e+03	7.0e+08		
21 February	3.2e+05	1.3e+04	3.1e+03	8.9e+08		

### *Daily Geomagnetic Data*

Date	Middle Latitude Fredericksburg		High Latitude College		Estimated Planetary	
	A	K-indices	A	K-indices	A	K-indices
	15 February	10	2-2-3-2-2-1-1-4	7	1-1-2-3-3-2-0-2	11
16 February	25	3-3-3-4-5-4-4-4	76	3-3-5-7-7-7-6-4	38	4-3-3-5-5-5-6-5
17 February	21	5-2-4-3-3-3-3-4	48	4-4-5-6-6-5-4-5	34	5-3-5-3-4-3-5-6
18 February	20	4-4-3-4-2-3-4-3	40	3-4-5-6-5-5-5-2	29	4-5-4-4-3-3-5-4
19 February	10	3-3-2-2-2-3-2-2	27	3-2-4-6-4-4-3-3	15	3-3-2-3-3-3-3-3
20 February	5	2-2-2-1-1-1-1-1	7	2-2-4-1-2-2-0-0	6	3-2-2-1-1-1-1-1
21 February	3	1-1-0-0-2-2-1-1	2	1-1-0-0-2-0-1-0	4	1-2-1-0-1-1-2-2



## *Alerts and Warnings Issued*

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
15 Feb 1110	WATCH: Geomagnetic Storm Category G1 predicted	
15 Feb 2251	WARNING: Geomagnetic K = 4	15/2250 - 16/0700
15 Feb 2257	ALERT: Geomagnetic K = 4	15/2257
15 Feb 2341	WARNING: Geomagnetic K = 5	15/2340 - 16/0600
16 Feb 0802	WARNING: Geomagnetic K = 4	16/0802 - 1300
16 Feb 1002	ALERT: Geomagnetic K = 4	16/1001
16 Feb 1030	EXTENDED WARNING: Geomagnetic K = 4	16/0802 - 1600
16 Feb 1030	WARNING: Geomagnetic K = 5	16/1028 - 1500
16 Feb 1201	ALERT: Geomagnetic K = 5	16/1159
16 Feb 1405	EXTENDED WARNING: Geomagnetic K = 5	16/1028 - 2200
16 Feb 1405	EXTENDED WARNING: Geomagnetic K = 4	16/0802 - 17/0700
16 Feb 1418	ALERT: Geomagnetic K = 5	16/1417
16 Feb 1719	ALERT: Geomagnetic K = 5	16/1717
16 Feb 2009	ALERT: Geomagnetic K = 5	16/2008
16 Feb 2031	WARNING: Geomagnetic K = 6	16/2030 - 2359
16 Feb 2031	EXTENDED WARNING: Geomagnetic K = 5	16/1028 - 17/0700
16 Feb 2101	ALERT: Geomagnetic K = 6	16/2059
16 Feb 2327	ALERT: Geomagnetic K = 5	16/2326
17 Feb 0158	ALERT: Geomagnetic K = 5	17/0154
17 Feb 0641	EXTENDED WARNING: Geomagnetic K = 4	16/0802 - 17/1500
17 Feb 0735	WARNING: Geomagnetic K = 5	17/0734 - 1400
17 Feb 0902	ALERT: Geomagnetic K = 5	17/0859
17 Feb 1330	ALERT: Electron 2MeV Integral Flux >= 1000pfu	17/1310
17 Feb 1348	EXTENDED WARNING: Geomagnetic K = 5	17/0734 - 2100
17 Feb 1348	EXTENDED WARNING: Geomagnetic K = 4	16/0802 - 18/0700
17 Feb 2005	ALERT: Geomagnetic K = 5	17/2004
17 Feb 2019	EXTENDED WARNING: Geomagnetic K = 5	17/0734 - 18/0400
17 Feb 2019	WATCH: Geomagnetic Storm Category G1 predicted	
17 Feb 2235	ALERT: Geomagnetic K = 5	17/2235

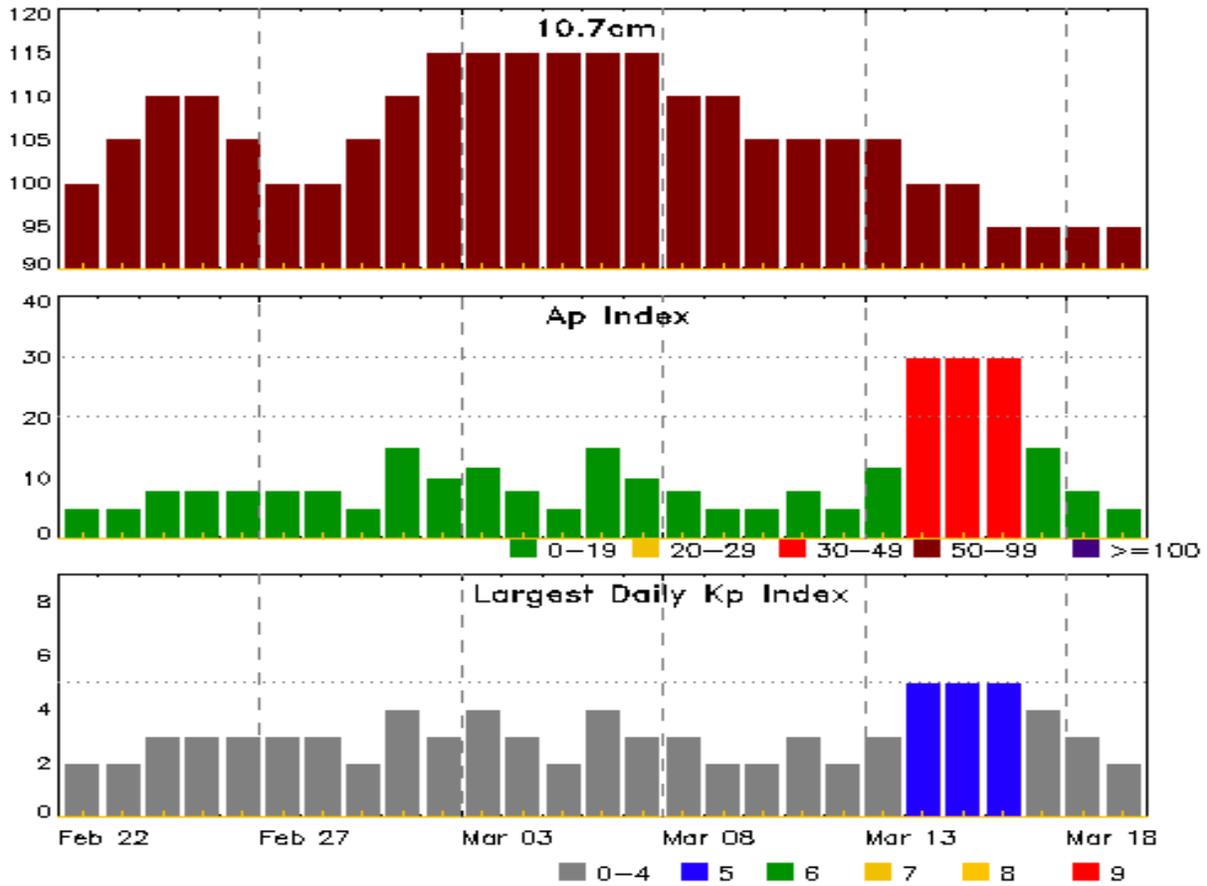


### *Alerts and Warnings Issued*

Date & Time of Issue UTC	Type of Alert or Warning	Date & Time of Event UTC
17 Feb 2306	WARNING: Geomagnetic K = 6	17/2304 - 18/0600
17 Feb 2306	EXTENDED WARNING: Geomagnetic K = 4	16/0802 - 18/1200
17 Feb 2306	EXTENDED WARNING: Geomagnetic K = 5	17/0734 - 18/0700
17 Feb 2308	ALERT: Geomagnetic K = 6	17/2307
18 Feb 0424	ALERT: Geomagnetic K = 5	18/0424
18 Feb 0606	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/1310
18 Feb 0656	EXTENDED WARNING: Geomagnetic K = 5	17/0734 - 18/1200
18 Feb 1156	EXTENDED WARNING: Geomagnetic K = 5	17/0734 - 18/1600
18 Feb 1156	EXTENDED WARNING: Geomagnetic K = 4	16/0802 - 18/1800
18 Feb 1526	EXTENDED WARNING: Geomagnetic K = 4	16/0802 - 19/0700
18 Feb 1526	EXTENDED WARNING: Geomagnetic K = 5	17/0734 - 18/2200
18 Feb 1836	WATCH: Geomagnetic Storm Category G1 predicted	
18 Feb 1840	EXTENDED WARNING: Geomagnetic K = 5	17/0734 - 19/0400
18 Feb 1911	ALERT: Geomagnetic K = 5	18/1910
19 Feb 0500	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/1310
19 Feb 0508	SUMMARY: 10cm Radio Burst	19/0454 - 0454
19 Feb 0655	EXTENDED WARNING: Geomagnetic K = 4	16/0802 - 19/1400
19 Feb 1641	WARNING: Geomagnetic K = 4	19/1640 - 20/1200
20 Feb 0501	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/1310
21 Feb 0500	CONTINUED ALERT: Electron 2MeV Integral Flux $\geq$ 1000pfu	17/1310



## Twenty-seven Day Outlook



Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index	Date	Radio Flux 10.7cm	Planetary A Index	Largest Kp Index
22 Feb	100	5	2	07 Mar	115	10	3
23	105	5	2	08	110	8	3
24	110	8	3	09	110	5	2
25	110	8	3	10	105	5	2
26	105	8	3	11	105	8	3
27	100	8	3	12	105	5	2
28	100	8	3	13	105	12	3
29	105	5	2	14	100	30	5
01 Mar	110	15	4	15	100	30	5
02	115	10	3	16	95	30	5
03	115	12	4	17	95	15	4
04	115	8	3	18	95	8	3
05	115	5	2	19	95	5	2
06	115	15	4				



### *Energetic Events*

Date	Time			X-ray	Optical Information			Peak		Sweep Freq		
	Begin	Max	Half Max	Class	Integ Flux	Imp/ Brtns	Location Lat CMD	Rgn #	Radio Flux 245	Radio Flux 2695	Intensity II	Intensity IV
15 Feb	1041	1100	1106	M1.1	0.007	1N	N10W52		2497			

### *Flare List*

Date	Time			X-ray Class	Imp/ Brtns	Location Lat CMD	Rgn #
	Begin	Max	End				
15 Feb	0402	0419	0424	C3.9			2497
15 Feb	0527	0533	0538	C1.4			2497
15 Feb	0635	0638	0640	B6.4			
15 Feb	0720	0723	0732	B9.1	SF	N09W52	2497
15 Feb	0804	0804	0805		SF	N12W54	2497
15 Feb	0821	0839	0901	C5.2	SF	N12W54	2497
15 Feb	0908	0910	0919		SF	N11W55	2497
15 Feb	0921	0933	1037	C2.3	1F	N10W52	2497
15 Feb	1037	1056	1159	M1.1	1N	N10W52	2497
15 Feb	1056	1058	1104		SF	S20W48	2500
15 Feb	1214	1215	1219		SF	N12W56	2497
15 Feb	1223	1225	1229		SF	N09W56	2497
15 Feb	1240	1243	1249		SF	N09W56	2497
15 Feb	1254	1258	1309		SF	N09W56	2497
15 Feb	1440	1504	1513	C3.3	1F	N14W58	2497
15 Feb	1714	1723	1727	C2.5	SF	N14W58	2497
15 Feb	1732	1736	1739	C1.6			2497
15 Feb	1746	1752	1800	C4.2			2497
15 Feb	1808	1812	1815	C2.2			
15 Feb	1842	1846	1849	C2.9	SF	N14W58	2497
15 Feb	1931	1937	1941	C1.2			
15 Feb	1946	1952	1955	C1.7	SF	N14W61	2497
15 Feb	2002	2006	2010	C1.6			2497
15 Feb	2053	2058	2105	C1.2			2497
15 Feb	2114	2140	2149	C4.1	1F	N16W57	2497
16 Feb	0145	0159	0204	C3.5			2497
16 Feb	0224	0228	0230	C1.2			
16 Feb	0637	0645	0650	C2.4			2497
16 Feb	0749	0754	0759	C1.1			2497
16 Feb	1036	1039	1041	B7.7			2497



## *Flare List*

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
16 Feb	1134	1138	1146	B5.4			2497
16 Feb	1336	1352	1357	C1.9			2497
16 Feb	1529	1548	1553	C2.1			2497
16 Feb	1647	1650	1657	C1.2			2497
16 Feb	1844	1850	1853	C2.8			2497
16 Feb	2008	2012	2016		SF	N17W73	2497
16 Feb	2210	2215	2232	B8.2			2497
16 Feb	2251	2258	2301	C1.3			2497
16 Feb	2332	2337	2340	B9.8			2497
17 Feb	0041	0046	0100	B9.6			2497
17 Feb	0103	0110	0114	C1.4			2497
17 Feb	0144	0148	0150	C2.2			2497
17 Feb	0217	0220	0225	B9.8			2497
17 Feb	0233	0247	0255	C2.0	SF	N11E85	2497
17 Feb	0420	0423	0427	C1.0			2497
17 Feb	0433	0439	0443	B9.5			2497
17 Feb	0454	0501	0507	C9.4			2497
17 Feb	0543	0550	0553	C2.0			2497
17 Feb	0617	0622	0625	C2.9			2497
17 Feb	0752	0756	0759	B9.1			2497
17 Feb	0839	0843	0846	C1.7	SF	N13W79	2497
17 Feb	0954	1002	1009	C2.0			2497
17 Feb	1059	1104	1109	C1.0			2497
17 Feb	1130	1134	1137	C1.2			2497
17 Feb	1148	1152	1157	B8.1			2497
17 Feb	B1225	U1227	A1254	C1.3	SF	N12W78	2497
17 Feb	1745	1751	1802	C1.2	SF	N05E05	2503
17 Feb	1806	1813	1819	C7.4	SF	N16W73	2497
17 Feb	2005	2022	2050	C4.6			2497
17 Feb	2152	2158	2202	C2.1			2497
18 Feb	0149	0158	0204	C7.2			2497
18 Feb	0401	0410	0421	C1.0			2497
18 Feb	0720	0727	0732	B7.8			2497
18 Feb	1607	1644	1721	C1.1			2497
18 Feb	1959	2025	2058	C1.2			2497
18 Feb	2108	2113	2117	C1.8	SF	N02E25	2501
18 Feb	2310	2315	2317	B4.9			
18 Feb	2318	2330	2345	B7.1			2497



## *Flare List*

Date	Time			X-ray Class	Optical		Rgn #
	Begin	Max	End		Imp/ Brtns	Location Lat CMD	
19 Feb	0003	0019	0053	C1.6			2497
19 Feb	0306	0321	0352	C2.0			
19 Feb	0433	0508	0551	C2.1			2497
19 Feb	0849	0902	0921	C1.4			2497
19 Feb	1236	1240	1252	B4.0			2497
19 Feb	1749	1758	1806	C1.0			
19 Feb	2249	2310	2318	C2.7			
20 Feb	0049	0131	0142	B8.9			
20 Feb	0649	0658	0711	B9.6			
20 Feb	0804	0809	0813	B4.6			
21 Feb	0423	0426	0429	B2.5			
21 Feb	0743	0753	0755	B5.1	SF	N06W39	2505
21 Feb	1010	1013	1021	B2.9	SF	N06W38	2505
21 Feb	1300	1304	1308	B5.1	SF	N06W39	2505



## Region Summary

Date	Location		Sunspot Characteristics				Flares																
	Lat	CMD	Helio Lon	Area 10 <sup>6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical											
									C	M	X	S	1	2	3	4							
<b>Region 2496</b>																							
05 Feb	N09E56		103	10		Axx	1	A	1														
06 Feb	N09E43		104	plage																			
07 Feb	N08E34		98	20	5	Bxi	4	B	3				2										
08 Feb	N08E19		102	10	6	Bxo	5	B															
09 Feb	N08E05		103	10	4	Bxo	2	B															
10 Feb	N08W09		103	10	5	Bxo	2	B					2										
11 Feb	N08W23		104	plage																			
12 Feb	N08W37		105	plage									1										
13 Feb	N08W51		106	plage									1										
14 Feb	N08W65		107	plage																			
15 Feb	N08W79		108	plage																			
									4	0	0	6	0	0	0	0	0						

Crossed West Limb.  
Absolute heliographic longitude: 103

<b>Region 2497</b>																							
06 Feb	N13E58		88	50	3	Dai	10	B					6										
07 Feb	N13E49		84	70	7	Dai	9	B															
08 Feb	N13E36		85	200	9	Dao	10	B															
09 Feb	N13E22		86	180	10	Dai	14	BG															
10 Feb	N13E08		86	240	12	Eac	22	BG	1				1										
11 Feb	N13W06		87	180	13	Eac	22	BGD	2				3	1									
12 Feb	N13W19		87	250	13	Eac	20	BGD	3	1			4										
13 Feb	N12W35		89	220	13	Eac	23	BGD	5	1			8	1									
14 Feb	N12W48		89	200	11	Eac	18	BGD	5	1			6	1									
15 Feb	N12W62		91	240	12	Eac	16	BGD	13	1			11	4									
16 Feb	N13W76		91	220	12	Eac	14	BGD	8				1										
17 Feb	N13W89		91	220	12	Eac	14	BGD	15				4										
									52	4	0	44	7	0	0	0	0						

Crossed West Limb.  
Absolute heliographic longitude: 87



**Region Summary - continued**

Date	Location		Sunspot Characteristics					Flares							
	Lat	CMD	Helio Lon	Area 10 <sup>6</sup> hemi.	Extent (helio)	Spot Class	Spot Count	Mag Class	X-ray			Optical			
									C	M	X	S	1	2	3

**Region 2498**

09 Feb	N19E58	50	10	2	Bxo	3	B					1					
10 Feb	N19E44	50	10	1	Axx	1	A										
11 Feb	N18E28	52	10	1	Axx	1	A										
12 Feb	N18E15	53	10	1	Axx	1	A										
13 Feb	N18E02	53	plage														
14 Feb	N18W12	54	plage														
15 Feb	N18W26	55	plage														
16 Feb	N18W40	55	plage														
17 Feb	N18W54	56	plage														
18 Feb	N18W68	57	plage														
19 Feb	N18W82	58	plage														
										0	0	0	1	0	0	0	0

Crossed West Limb.  
Absolute heliographic longitude: 53

**Region 2499**

12 Feb	N11E38	30	10	1	Axx	1	A										
13 Feb	N11E24	31	plage														
14 Feb	N11E11	31	plage														
15 Feb	N11W03	32	plage														
16 Feb	N11W17	32	plage														
17 Feb	N11W31	33	plage														
18 Feb	N11W45	34	plage														
19 Feb	N11W59	35	plage														
20 Feb	N11W73	36	plage														
21 Feb	N11W87	37	plage														
										0	0	0	0	0	0	0	0

Still on Disk.  
Absolute heliographic longitude: 32

**Region 2500**

13 Feb	S18W29	83	10	3	Bxo	3	B										
14 Feb	S18W42	83	20	3	Cro	3	B	1									
15 Feb	S18W56	85	10	1	Axx	1	A					1					
16 Feb	S18W70	85	plage														
17 Feb	S18W84	86	plage														
										1	0	0	1	0	0	0	0

Crossed West Limb.  
Absolute heliographic longitude: 83



**Region Summary - continued**

Date	Location		Sunspot Characteristics					Flares									
	Lat	CMD	Helio	Area	Extent	Spot	Spot	Mag	X-ray			Optical					
			Lon	10 <sup>-6</sup> hemi.	(helio)	Class	Count	Class	C	M	X	S	1	2	3	4	
<b>Region 2501</b>																	
14 Feb	N04E76		325	60	2	Hsx	1	A									
15 Feb	N04E62		327	60	2	Hsx	1	A									
16 Feb	N04E48		327	30	1	Hsx	1	A									
17 Feb	N05E34		328	50	2	Hsx	1	A									
18 Feb	N05E20		329	50	2	Hsx	1	A	1				1				
19 Feb	N04E09		327	80	4	Cso	3	B									
20 Feb	N04W04		327	80	3	Cso	3	B									
21 Feb	N04W18		328	70	3	Cso	4	B									
									1	0	0		1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 327

<b>Region 2502</b>																	
16 Feb	N08W00		15	10	3	Bxo	4	B									
17 Feb	N08W14		16	10	4	Bxo	2	B									
18 Feb	N09W28		17	10	3	Bxo	3	B									
19 Feb	N07W42		18	plage													
20 Feb	N07W55		18	plage													
21 Feb	N07W70		20	plage													
									0	0	0		0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 15

<b>Region 2503</b>																	
17 Feb	N06W00		2	20	2	Cro	3	B	1				1				
18 Feb	N06W14		3	10	1	Axx	1	A									
19 Feb	N05W27		2	20	5	Cro	6	B									
20 Feb	N05W40		3	plage													
21 Feb	N05W55		5	plage													
									1	0	0		1	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 2

<b>Region 2504</b>																	
19 Feb	N12W02		338	10	3	Bxo	3	B									
20 Feb	N12W17		340	20	3	Cro	3	B									
21 Feb	N13W30		340	10	3	Bxo	3	B									
									0	0	0		0	0	0	0	0

Still on Disk.

Absolute heliographic longitude: 338



***Region Summary - continued***

Date	Location		Sunspot Characteristics				Flares												
	Lat	CMD	Helio Lon	Area 10 <sup>-6</sup>	Extent hemi.	Spot (helio) Class	Spot Count	Mag Class	X-ray			Optical							
									C	M	X	S	1	2	3	4			
<b><i>Region 2505</i></b>																			
20 Feb	N08W32		355	110	7	Dai	10	B											
21 Feb	N08W45		355	180	9	Dac	10	B					3						
									0	0	0	3	0	0	0	0	0		

Still on Disk.

Absolute heliographic longitude: 355

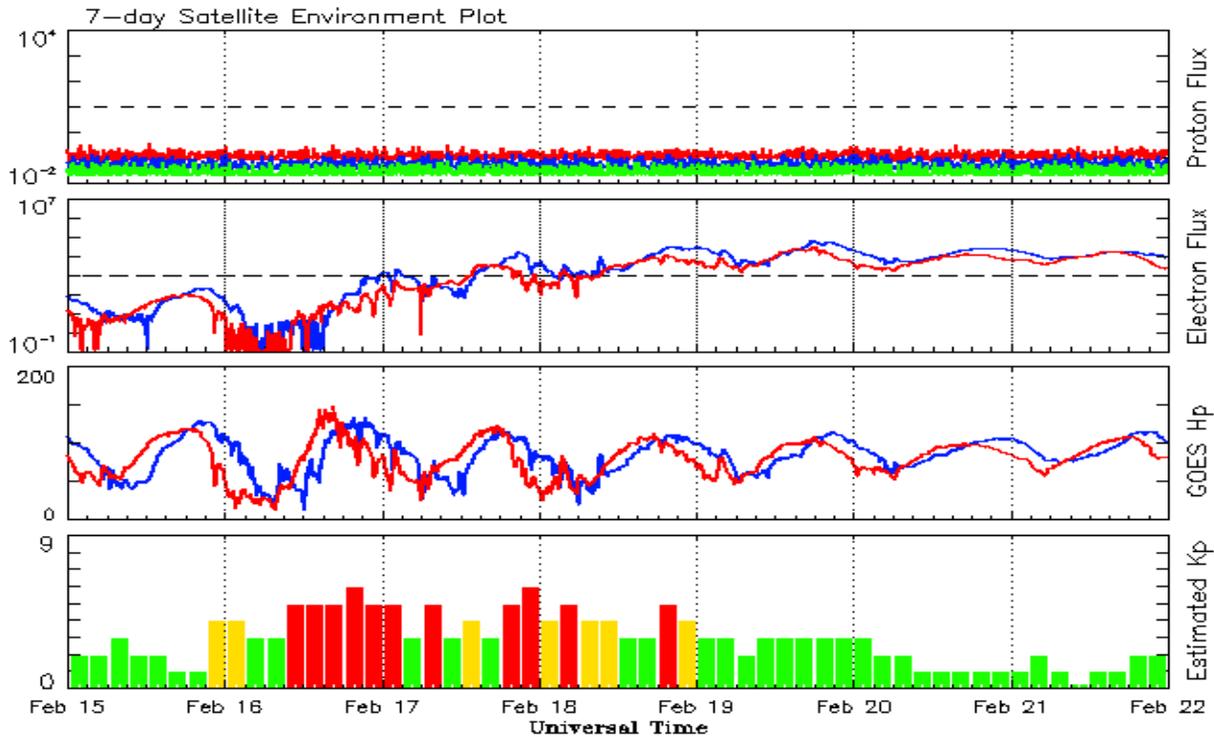


**Recent Solar Indices (preliminary)**  
**Observed monthly mean values**

Month	Sunspot Numbers					Radio Flux		Geomagnetic		
	Observed values		Ratio	Smooth values		Penticton	Smooth	Planetary	Smooth	
	SEC	RI	RI/SEC	SEC	RI	10.7 cm	Value	Ap	Value	
<b>2014</b>										
February	174.6	102.3	0.59	119.5	119.5	78.3	170.3	138.6	12	6.9
March	141.1	91.9	0.65	123.2	123.2	80.8	149.9	140.8	6	7.2
April	130.5	67.5	0.65	124.8	124.8	69.8	144.3	143.5	9	7.5
May	116.8	67.5	0.64	122.3	122.3	69.0	130.0	144.7	7	7.9
June	107.7	61.7	0.66	121.4	121.4	68.5	122.2	145.5	7	8.4
July	113.6	60.1	0.64	120.4	120.4	67.6	137.3	145.2	5	8.8
August	106.2	64.1	0.70	115.1	115.1	65.0	124.7	142.8	9	8.9
September	127.4	78.0	0.69	107.4	107.4	61.1	146.1	140.1	11	9.3
October	92.0	54.0	0.66	101.7	101.7	58.4	153.7	138.4	10	9.9
November	101.8	62.2	0.69	97.9	97.9	56.8	155.3	137.4	10	10.1
December	120.0	67.7	0.65	95.2	95.2	55.3	158.7	137.0	12	10.5
<b>2015</b>										
January	101.2	55.8	0.66	92.1	92.1	53.6	141.7	135.8	10	11.0
February	70.6	40.0	0.63	88.3	88.3	51.7	128.8	133.8	10	11.5
March	61.7	32.7	0.62	84.2	84.2	49.3	126.0	131.2	17	12.0
April	72.5	45.2	0.75	80.5	80.5	47.3	129.2	127.3	12	12.4
May	83.0	53.3	0.71	77.5	77.5	45.6	120.1	123.3	9	12.7
June	77.3	39.9	0.53	73.1	73.1	43.2	123.2	119.5	14	13.0
July	68.4	39.5	0.58	68.2	68.2	40.9	107.0	116.0	10	13.1
August	61.6	38.6	0.63				106.2		16	
September	72.5	47.2	0.65				102.1		16	
October	59.5	37.0	0.62				104.1		15	
November	61.8	37.9	0.61				109.6		13	
December	54.1	34.6	0.64				112.8		15	
<b>2016</b>										
January	50.4	34.0	0.67				103.5		10	

**Note:** Values are final except for the most recent 6 months which are considered preliminary.  
Cycle 24 started in Dec 2008 with an RI=1.7.





*Weekly Geosynchronous Satellite Environment Summary  
Week Beginning 15 February 2016*

The proton flux plot contains the five-minute averaged integral proton flux (protons/cm<sup>2</sup>-sec -sr) as measured by the SWPC Primary GOES satellite, near West 75, for each of three energy thresholds: greater than 10, 50, and 100 MeV.

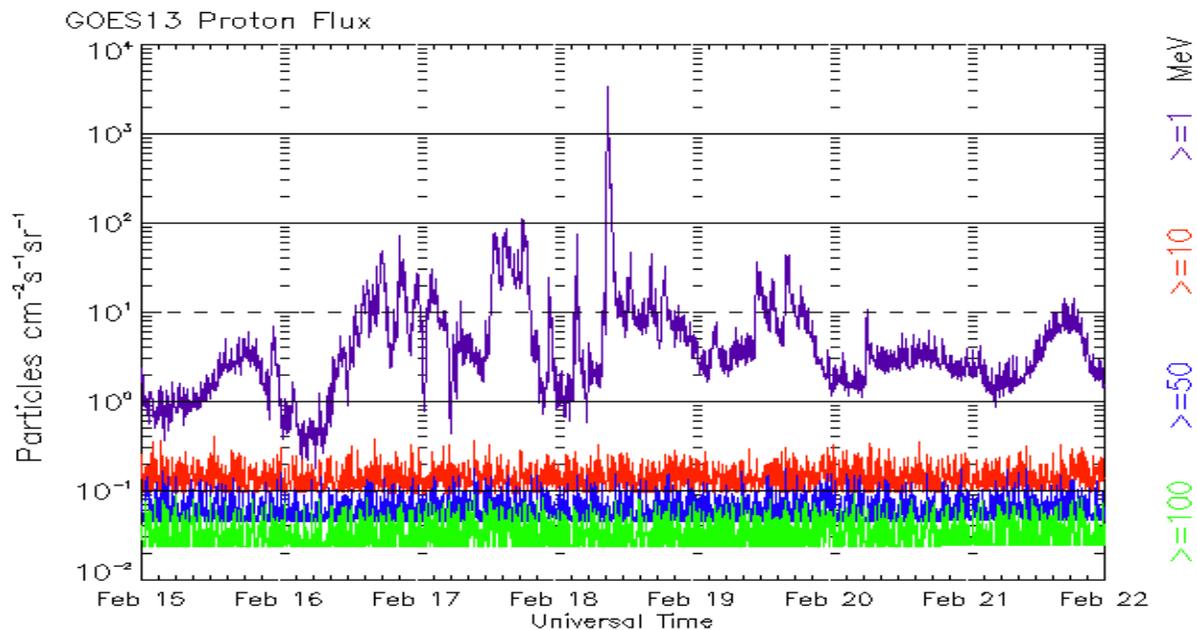
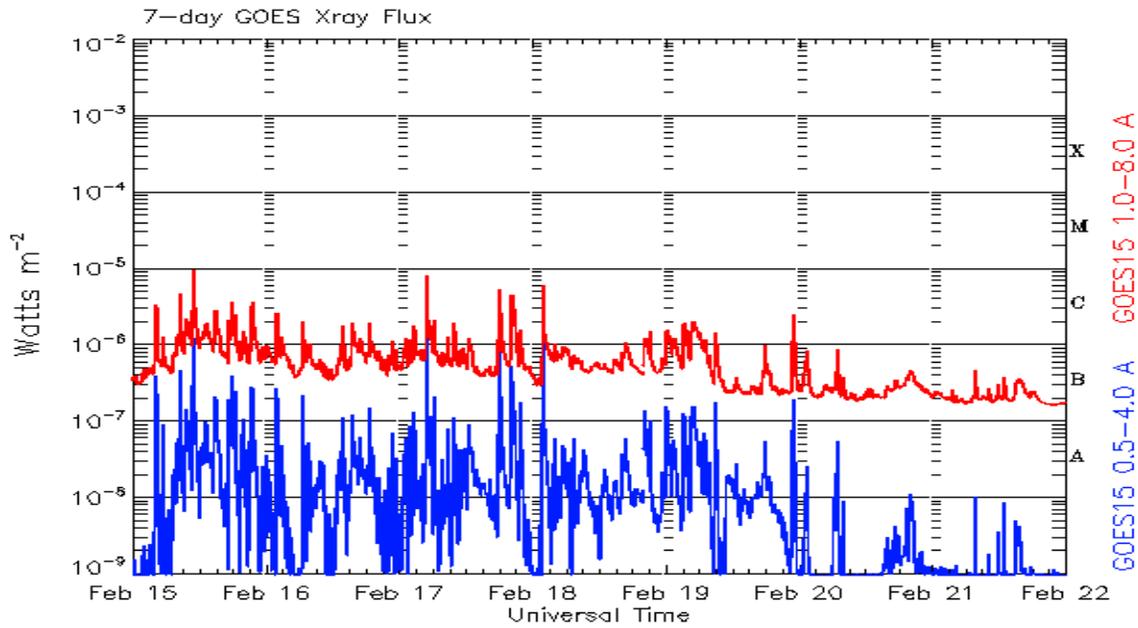
The electron flux plot contains the five-minute averaged integral electron flux (electrons/cm<sup>2</sup>-sec -sr) with energies greater than 2 MeV by the SWPC Primary GOES satellite.

The Hp plot contains the five minute averaged Hp magnetic field component in nanoteslas (nT) as by the SWPC Primary GOES satellite. The Hp component is parallel to the spin axis of the satellite, which is nearly parallel to the Earth's rotation axis.

The Estimated 3-hour Planetary Kp-index is derived at the NOAA Space Weather Prediction Center using data from the following ground-based magnetometers: Boulder, Colorado; Chambon la Foret, France; Fredericksburg, Virginia; Fresno, California; Hartland, UK; Newport, Washington; Sitka, Alaska. These data are made available thanks to the cooperative efforts between SWPC and data providers around the world, which currently includes the U.S. Geological Survey, the British Geological Survey, and the Institut de Physique du Globe de Paris.

The data included here are those now available in real time at the SWPC and are incomplete in that they do not include the full set of parameters and energy ranges known to cause satellite operating anomalies. The proton and electron fluxes and Kp are 'global' parameters that are applicable to a first order approximation over large areas. H parallel is subject to more localized phenomena and the measurements generally are applicable to within a few degrees of longitude of the measuring satellite.





*Weekly GOES Satellite X-ray and Proton Plots  
Week Beginning 15 February 2016*

The x-ray plots contains five-minute averages x-ray flux ( $Watt/m^2$ ) as measure by the SWPC primary GOES X-ray satellite, usually at West 105 longitude, in two wavelength bands, 0.05 - 0.4 and 0.1 - 0.8 nm. The letters A, B, C, M and X refer to x-ray event levels for the 0.1 - 0.8 nm band.

The proton plot contains the five-minute averaged intergral flux units (pfu = protons/ $cm^2$  -sec -sr) as measured by the primary SWPC GOES Proton satellite for each of the energy thresholds: >1, >10, >30, and >100 MeV. The P10 event threshold is 10 pfu at greater than 10 MeV.



## ***Preliminary Report and Forecast of Solar Geophysical Data (The Weekly)***

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**Notice:** The 27-day Outlook, Satellite Environment, X-ray and Proton plots have been redesigned. Comments and suggestions are welcome SWPC.Webmaster@noaa.gov

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